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Rb-Sr WHOLE-ROCK AGE OF THE ELDORA-BRYAN STOCK, FRONT RANGE, COLORADO

D. G. BROOKINS }
M. S. ABASHIAN }

Department of Geology, University of New Mexico, Albuquerque, NM 87131

We report a Rb-Sr whole-rock date for the Eldora-Bryan stock, Front Range, Colorado. Ten samples consisting of quartz monzonite from the stock near Eldora, Colorado, were analyzed. In table 1 a compilation of geochronologic ages for the Eldora-Bryan stock (referred to as Eldora Stock) from Carpenter and others (1979) is shown. A fairly wide range in ages is noted. We have not included Sr data from Simmons and Hedge (1978), as total Sr was analyzed only by x-ray fluorescence techniques. The calculated age for the ten samples is 69.95 ± 7.00 m.y.b.p. with initial $^{87}\text{Sr}/^{86}\text{Sr} = 0.70753 \pm 0.00011$.

ANALYTICAL PROCEDURES

The Rb and Sr contents were determined by isotope dilution, and the data are precise to $\pm 0.5\%$ (two sigma). The $^{87}\text{Sr}/^{86}\text{Sr}$ data were calculated from the Sr isotope dilution experiments and are precise to ± 0.00005 (two sigma). Seven runs on Eimer and Amend SrCO_3 Standard yielded 0.70803 ± 0.00004 . All Sr isotopic data were normalized to $^{86}\text{Sr}/^{88}\text{Sr} = 0.1194$. The decay constant for ^{87}Rb was taken as $1.42 \times 10^{-11}/\text{y}$, and standard least-squares analysis was used to calculate the isochrons shown in the figure. The Rb, Sr, and Sr isotopic data are shown in table 2.

TABLE 1. Summary of previous ages for the Eldora-Bryan stock.¹

Mineral	Age (m.y.b.p.)	Method	Reference
coarse biotite	54.8	K-Ar	Hart (1964)
fine biotite-hornblende	53.7	K-Ar	Hart (1964)
coarse biotite	63.9 ± 9	Rb-Sr	Hart (1964)
apatite	73 ± 7	fission track	Naeser and Faul (1969)
sphene	67.1 ± 7.5	fission track	Naeser and Faul (1969)
zircon	68.8 ± 5.5	fission track	Cunningham and others (1977)
zircon	61.8 ± 5.5	fission track	Cunningham and others (1977)
apatite	58.5 ± 8.8	fission track	Cunningham and others (1977)
biotite	59.1 ± 1.8	K-Ar	McDowell (1971)

¹From Carpenter and others (1979).

TABLE 2. Rb-Sr data, locations, and mineralogy for Eldora-Bryan stock, Boulder County, Colorado.

Sample #	N latitude	W longitude	$^{87}\text{Sr}/^{86}\text{Sr}$	Rb (ppm)	Sr (ppm)	$^{87}\text{Rb}/^{86}\text{Sr}$	Mineralogy
EL-1a	39°37'05"	105°35'10"	0.7083	188.2	802.0	0.680	38% K-feldspar, 32% plagioclase, 17% quartz, 5% biotite, 3% hornblende, 3% opaques
EL-1b	39°37'05"	105°35'10"	0.7082	187.8	797.4	0.682	38% K-feldspar, 32% plagioclase, 17% quartz, 5% biotite, 3% hornblende, 3% opaques
EL-11a	39°37'05"	105°35'10"	0.7083	206.6	552.5	1.082	38% plagioclase, 30% quartz, 20% K-feldspar, 5% biotite, 5% hornblende, 2% opaques, trace sphene
EL-11b	39°37'05"	105°35'10"	0.7085	208.0	551.1	1.093	38% plagioclase, 30% quartz, 20% K-feldspar, 5% biotite, 5% hornblende, 2% opaques, trace sphene
EL-12a	39°37'05"	105°35'10"	0.7089	223.4	448.9	1.441	35% plagioclase, 30% K-feldspar, 25% quartz, 5% biotite, 3% hornblende, 2% opaques
EL-12a'	39°37'05"	105°35'10"	0.7089	220.1	442.9	1.507	35% plagioclase, 30% K-feldspar, 25% quartz, 5% biotite, 3% hornblende, 2% opaques
EL-15	39°37'05"	105°35'10"	0.7092	227.7	412.9	1.597	33% K-feldspar, 32% plagioclase, 28% quartz, 5% biotite, 2% hornblende, 1% opaques

continued

TABLE 2. Rb-Sr data, locations, and mineralogy for Eldora-Bryan stock, Boulder County, Colorado (continued).

Sample #	N latitude	W longitude	$^{87}\text{Sr}/^{86}\text{Sr}$	Rb (ppm)	Sr (ppm)	$^{87}\text{Rb}/^{86}\text{Sr}$	Mineralogy
EL-16	39°37'05"	105°35'10"	0.7087	208.7	551.7	1.095	32% plagioclase, 30% K-feldspar, 30% quartz, 5% biotite, 2% hornblende, 2% opaques
EL-17i	39°37'05"	105°35'10"	0.7090	217.7	504.9	1.248	32% plagioclase, 30% K-feldspar, 30% quartz, 5% biotite, 2% hornblende, 2% opaques
EL-17ii	39°37'05"	105°35'10"	0.7096	244.3	363.6	1.946	32% plagioclase, 30% K-feldspar, 30% quartz, 5% biotite, 2% hornblende, 2% opaques

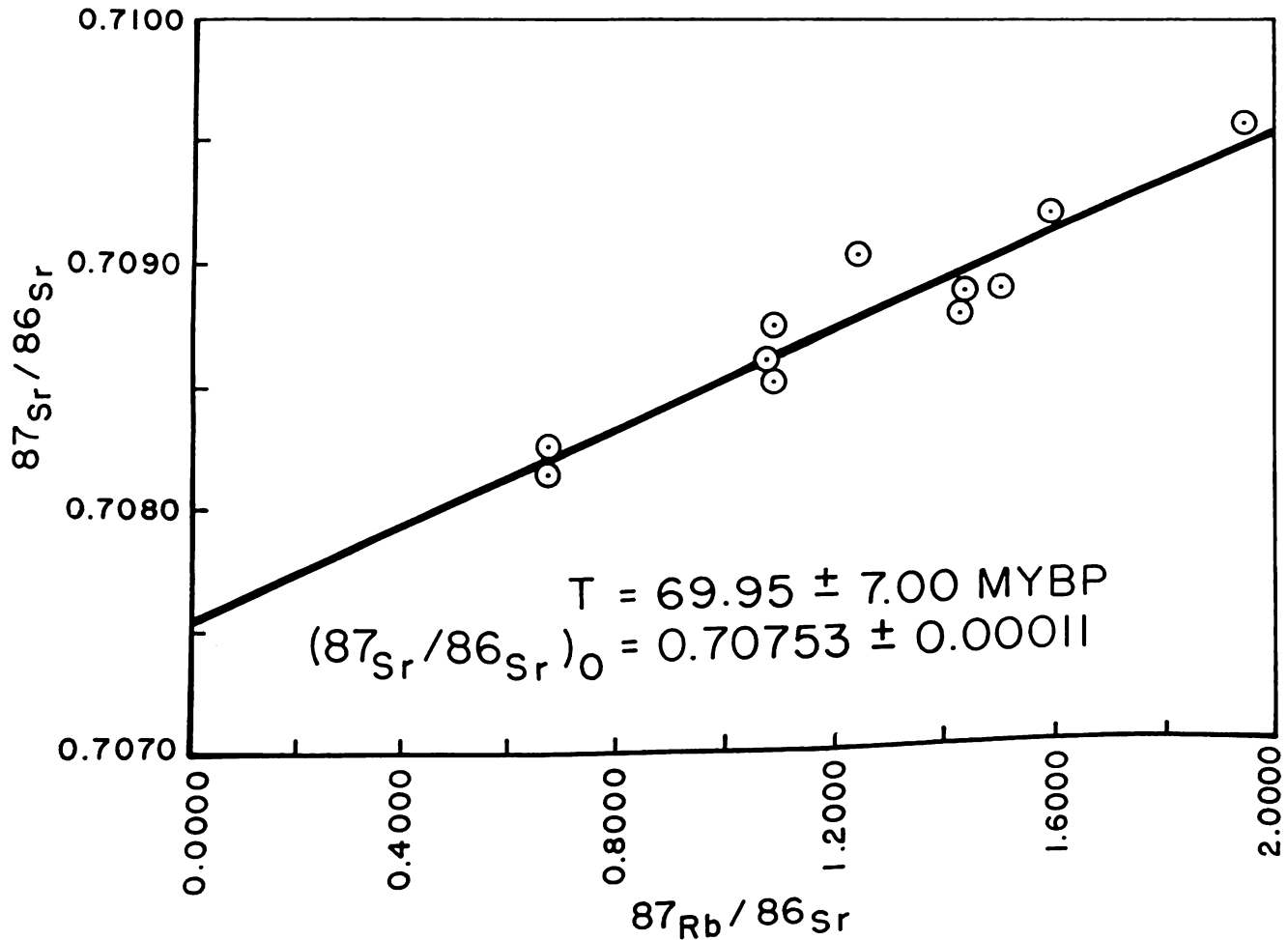


FIGURE 1. Rb-Sr whole-rock isochron for Eldora-Bryan stock.

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